

CLAIMS:

What is claimed is:

1. An acetabular reamer comprising a reaming head comprising a plurality of arcuately-shaped segments, the plurality of segments being generally symmetrically distributed about a center point, and being extendable or retractable about the center point to create a variable dimensioned recess in an acetabular region.
2. The acetabular reamer of claim 1, further comprising an actuator for selectively extending or retracting the segments so that the segments remain generally symmetrically distributed about the center point as the segments are expanded or retracted.
3. The reamer of claim 2 wherein the actuator further comprises:
 - a plurality of translating mechanisms, each mechanism having a first end and second end, the first end attached to a respective segment on a side opposite the convex surface of the segment, each translating mechanism providing translational movement of the respective segment;
 - 15 a transmission, mechanically coupled to each of the translating mechanisms at the second end, for transferring a rotational movement to the translating mechanism; and
 - an adjustment rod for applying the rotational movement to the transmission.
- 20 4. The reamer of claim 3 wherein the translating mechanism further comprises:
 - a screw coupled to the transmission for transferring the rotational movement; and

a threaded sleeve, having a first sleeve end for attaching the segment and a second sleeve end for receiving the screw, the threaded sleeve being engaged with the screw for converting the rotational movement to a translational movement of the segment.

5 5. The reamer of claim 2 wherein the actuator further comprises an adjustment handle, coupled to the adjustment rod, for applying a rotational movement to the adjustment rod so that the respective segments synchronously move a predetermined translation distance such that the segments remain generally symmetrically distributed about the center point when a rotational
10 movement is applied to the adjustment handle.

6. The reamer of claim 5 wherein the adjustment handle further comprises a locking mechanism for selectively locking the adjustment handle in incremental positions corresponding to incremental translation distances of the segments.

7. The reamer of claim 6 wherein the incremental translation distances are
15 1 millimeter (0.04 inch) increments.

8. The reamer of claim 1 wherein the plurality of segments form an arc subtending an angle of approximately 180 degrees about the center point.

9. The reamer of claim 1 wherein each segment further comprises a convex cutting surface.

20 10. The reamer of claim 1 wherein the convex cutting surface further comprises a cupped configuration for cutting and scooping bone material away from the acetabular region.

11. The reamer of claim 1 wherein the convex cutting surface further comprises a grating hole configuration for cutting bone material away from the acetabular region.
12. The reamer of claim 1, further comprising
 - 5 a drive shaft having a driving end and a driven end, the reaming head attached to driving end and the driven end adapted to receive a rotational driver, the drive shaft transferring rotational movement to the reaming head for reaming the acetabular region.
13. The reamer of claim 12, further comprising a freely spinning sleeve,
 - 10 slidingly positioned over the drive shaft for allowing an operator to hold the reamer without interfering with a rotation of the drive shaft.
14. An acetabular reamer comprising:
 - a reaming head comprising a plurality of arcuately-shaped segments, the plurality of segments generally symmetrically distributed about a center point, the plurality of segments extendable or retractable about the center point to create a variable dimensioned recess in an acetabular region, each segment further comprising a convex cutting surface;
 - 15 a plurality of translating mechanisms, each mechanism having a first end and second end, the first end attached to a respective segment on a side opposite the convex surface of the segment, each translating mechanism providing translational movement of the respective segment;
 - 20 a transmission, mechanically coupled to each of the translating mechanisms at the second end, for transferring a rotational movement to the translating mechanism; and
 - 25 an adjustment rod for applying the rotational movement to the transmission;
 - an adjustment handle, coupled to the adjustment rod, for applying the rotational movement to the adjustment rod so that the respective segments

synchronously move a predetermined translation distance such that the segments remain uniformly aligned in the desired cutting arc, when a rotational movement is applied to the adjustment handle;

5 a drive shaft having a driven end and a driving end, the reaming head attached to driving end and the driven end adapted to receive a rotational driver, the drive shaft transferring rotational movement to the reaming head for reaming the acetabular region; and

10 a freely spinning sleeve, slidingly positioned over the drive shaft for allowing an operator to hold the reamer without interfering with a rotation of the drive shaft.

15 15. A surgical cutting tool comprising a reaming head comprising a plurality of arcuately-shaped segments, the plurality of segments generally symmetrically distributed about a center point, the plurality of segments extendable or retractable about the center point to create a variable dimensioned recess.

16. The surgical cutting tool of claim 15, further comprising an actuator for selectively extending or retracting the segments so that the convex surfaces of the segments are uniformly aligned in the desired cutting arc.